

DYNAMIC DEFORMATION OF ETNA VOLCANO OBSERVED BY GPS AND SAR INTERFEROMETRY

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Synthetic aperture radar (SAR) interferometry and GPS have shown that during the quiescent period from 1993-1995 Mt. Etna volcano, Italy, inflated. Since the initiation of eruptive activity since late 1995 the deformation has been more contentious. We will explore the detailed deformation during the period from 1995-1996 spanning the late stages of inflation and the beginning of eruptive activity. We use SAR interferometry and GPS data to measure the volcano deformation. We invert the observed deformation for both simple point or tensile crack elastic sources or if warranted for a spheroidal pressure source. In particular, we will examine the evolution of the inflation and the transition to a lesser deflation observed at the end of 1995. We use ERS-1/2 SAR data from both ascending and descending passes to allow for dense temporal sampling of the deformation and to allow us to critically assess atmospheric noise. Preliminary results from interferometry suggest that the inflation rate accelerated prior to resumption of activity in 1995, while GPS data suggest a more steady inflation with some fluctuation following the start of activity. This study will compare and contrast the interferometric SAR and GPS results and will address the strengths and weaknesses of each technique towards volcano deformation studies.